Plug-in Electric Vehicle Infrastructure Site Selection Workshop

California Energy Commission Investments in
Plug-in Electric Vehicle Charging Infrastructure
CPUC Auditorium, 505 Van Ness Avenue, San Francisco

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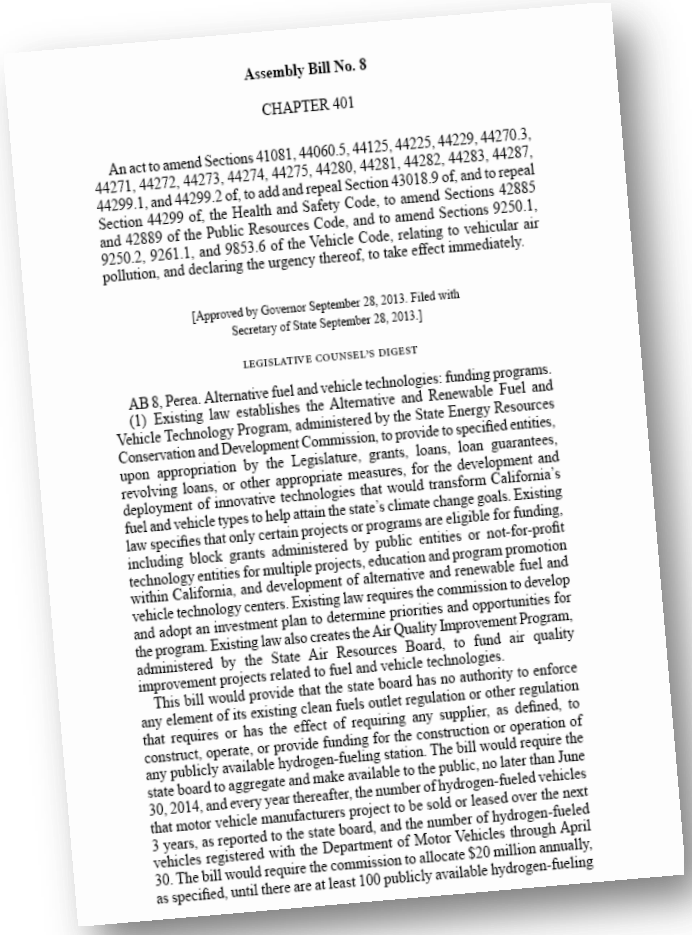
Assembly Bill 8

(Perea, Chapter 401, Statutes of 2013)



Assembly Bill No. 8

CHAPTER 401

An act to amend Sections 41081, 44060.5, 44125, 44225, 44229, 44270.3, 44271, 44272, 44273, 44274, 44275, 44280, 44281, 44282, 44283, 44287, 44299.1, and 44299.2 of, to add and repeal Section 43018.9 of, and to repeal Section 44299 of, the Health and Safety Code, to amend Sections 42885 and 42889 of the Public Resources Code, and to amend Sections 9250.1, 9250.2, 9261.1, and 9853.6 of the Vehicle Code, relating to vehicular air pollution, and declaring the urgency thereof, to take effect immediately.

[Approved by Governor September 28, 2013. Filed with Secretary of State September 28, 2013.]

LEGISLATIVE COUNSEL'S DIGEST

AB 8, Perea. Alternative fuel and vehicle technologies: funding programs.

(1) Existing law establishes the Alternative and Renewable Fuel and Vehicle Technology Program, administered by the State Energy Resources Conservation and Development Commission, to provide to specified entities, upon appropriation by the Legislature, grants, loans, loan guarantees, revolving loans, or other appropriate measures, for the development and deployment of innovative technologies that would transform California's fuel and vehicle types to help attain the state's climate change goals. Existing law specifies that only certain projects or programs are eligible for funding, including block grants administered by public entities or not-for-profit technology entities for multiple projects, education and program promotion within California, and development of alternative and renewable fuel and vehicle technology centers. Existing law requires the commission to develop and adopt an investment plan to determine priorities and opportunities for the program. Existing law also creates the Air Quality Improvement Program, administered by the State Air Resources Board, to fund air quality improvement projects related to fuel and vehicle technologies.

This bill would provide that the state board has no authority to enforce any element of its existing clean fuels outlet regulation or other regulation that requires or has the effect of requiring any supplier, as defined, to construct, operate, or provide funding for the construction or operation of any publicly available hydrogen-fueling station. The bill would require the state board to aggregate and make available to the public, no later than June 30, 2014, and every year thereafter, the number of hydrogen-fueled vehicles that motor vehicle manufacturers project to be sold or leased over the next 3 years, as reported to the state board, and the number of hydrogen-fueled vehicles registered with the Department of Motor Vehicles through April 30. The bill would require the commission to allocate $20 million annually, as specified, until there are at least 100 publicly available hydrogen-fueling

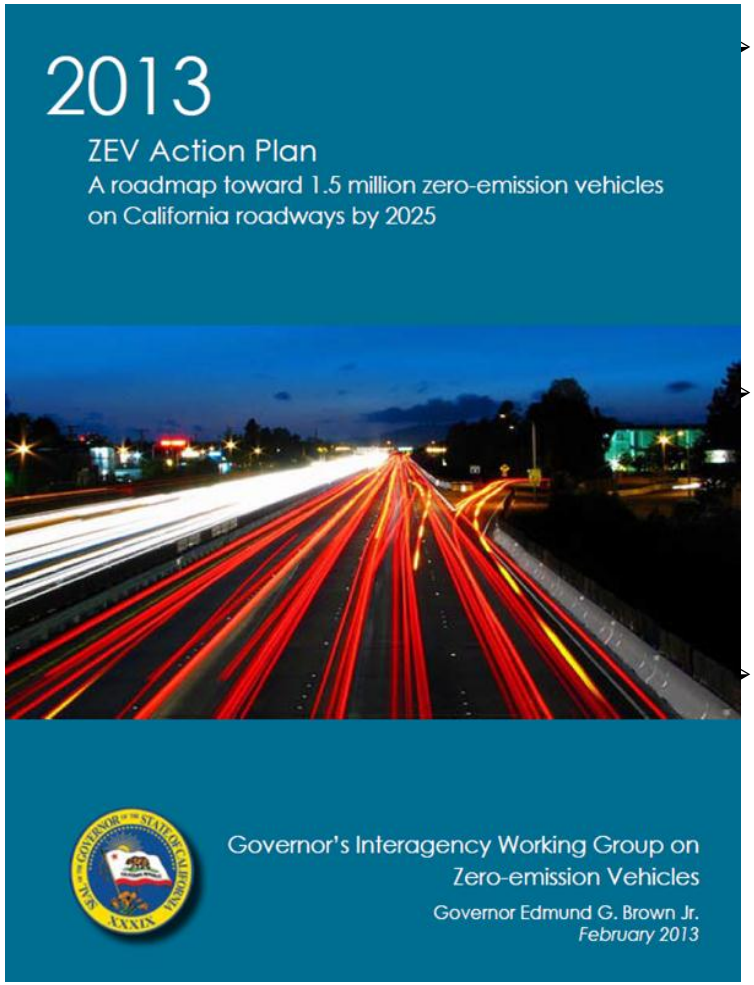
- Extends ARFVTP funding through January 1, 2024
  - ✓$100 million per year
- To transform California's transportation market into a diverse collection of alternative fuels and technologies and reduce California's dependence on petroleum.

  *"…**develop and deploy innovative technologies that transform California's fuel and vehicle types to help attain the state's climate change policies.**"* (Health and Safety Code Section 44272(a))

Key Policies and Regulations

Policy Objectives	Policy Origin	Goals and Milestones
Greenhouse Gas Reduction	AB 32, Executive Order S-3-05, LCFS Executive Order B-30-15	Reduce greenhouse gas emissions to 1990 levels by 2020, 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050 in California
Petroleum Reduction	Governor's State of the State Speech	Governor's new target of 50% reduction for cars and trucks by 2030
Low Carbon Fuel Standard	AB 32, California Global Warming Solutions Act	10% reduction in carbon intensity of transportation fuels in California by 2020
Federal Renewable Fuel Standard	Energy Policy Act of 2005, Energy Independence and Security Act of 2007	36 billion gallons of renewable fuel by 2022
Air Quality	Clean Air Act	80% reduction in NOx from current levels by 2023
ZEV Mandate	California Executive Order B-16-2012	Accommodate 1 million EVs by 2020 and 1.5 million by 2025 in California

2013 ZEV Action Plan EV Infrastructure Related Goals



- **By 2015**: the State's major metropolitan areas will be able to accommodate ZEVs through infrastructure plans and streamlined permitting
- **By 2020**: the State's ZEV infrastructure will be able to support up to 1 million vehicles
- **By 2025**: Over 1.5 millions ZEVs will be on California roadways and their market share will be expanding. Californians will also have easy access to ZEV infrastructure.

2013 ZEV Action Plan Actions Related to PEV Infrastructure

- Develop Statewide PEV Infrastructure Plan
- Support completion of regional PEV plans which include PEV infrastructure plans
- Identify a path to complete the West Coast Green Highway (BC to Mexico)
- Encourage hosting of PEV chargers in multi-unit buildings
- Build awareness among state's major employers about workplace charging benefits
- Expand incentives to encourage California companies to install workplace charging infrastructure
- Promote cost-effective charging infrastructure at appropriate longer-term public parking locations

2014 Integrated Policy Report: Next Steps

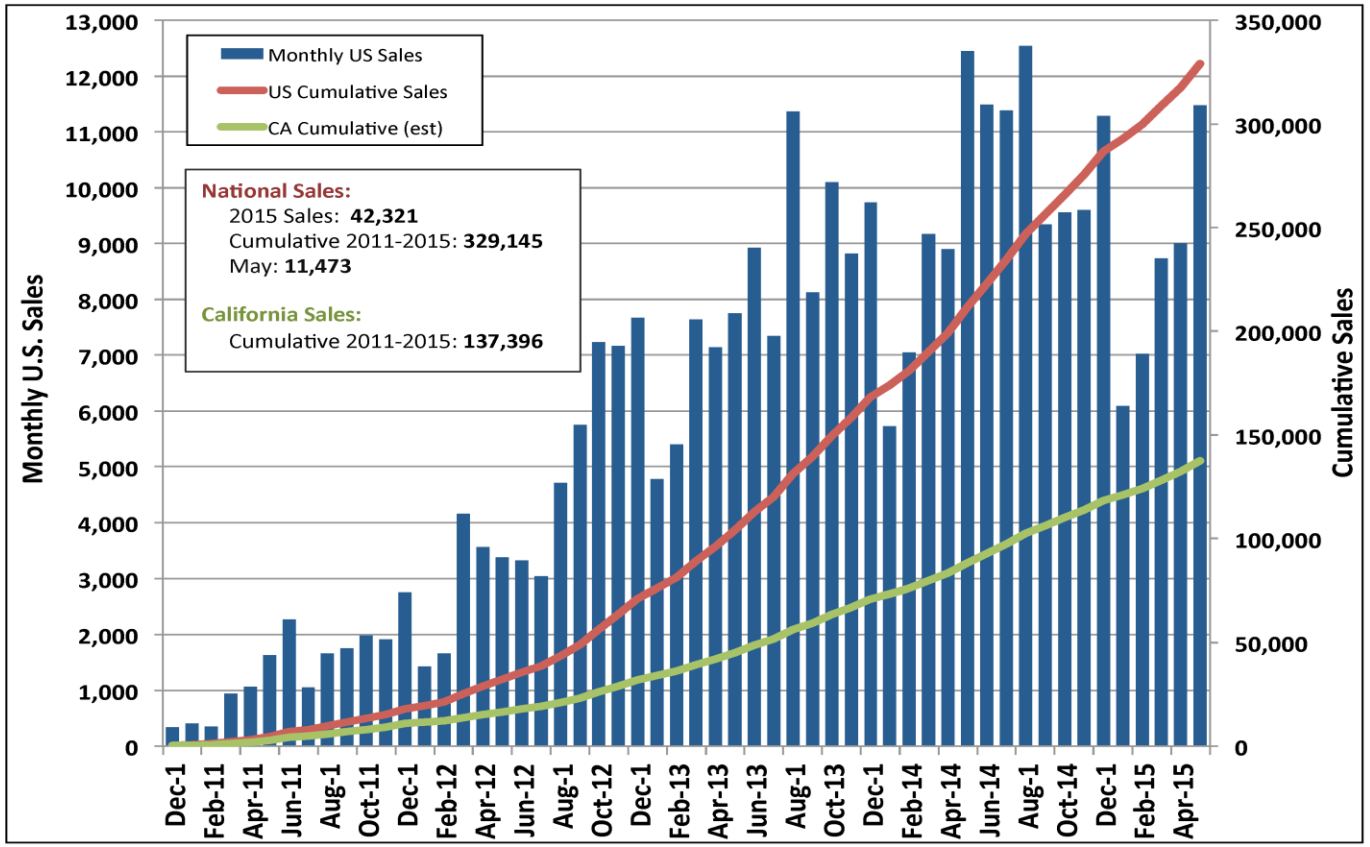
- Continued support of regional PEV readiness plans
- Development of solicitations to promote low cost/high benefit charging infrastructure for consumers
- Develop DC Fast Charger Corridor gaps analysis and strategy
- Develop strategies to: 1) remove barriers to multi-unit dwellings and workplace charging deployment, 2) address charging congestion in metro areas, and 3) increase PEV driver range confidence and electric miles driven
- Refine assumptions in NREL Statewide PEV Infrastructure Assessment

ARFVTP Funding Summary: 2009-2015

Investment Areas	Funding Amount (in millions)	Percent of Total (%)	Number of Awards
Biofuels	$157	27	56
Electric Drive	$193	33	150
Natural Gas	$97	17	182
Hydrogen	$99	17	33
Workforce Development	$25	4	55
Market & Program Develop.	$13	2	16
Total	**$584**	**100**	**492**

May 2015 PEV Sales

CALIFORNIA PLUG-IN ELECTRIC VEHICLE COLLABORATIVE

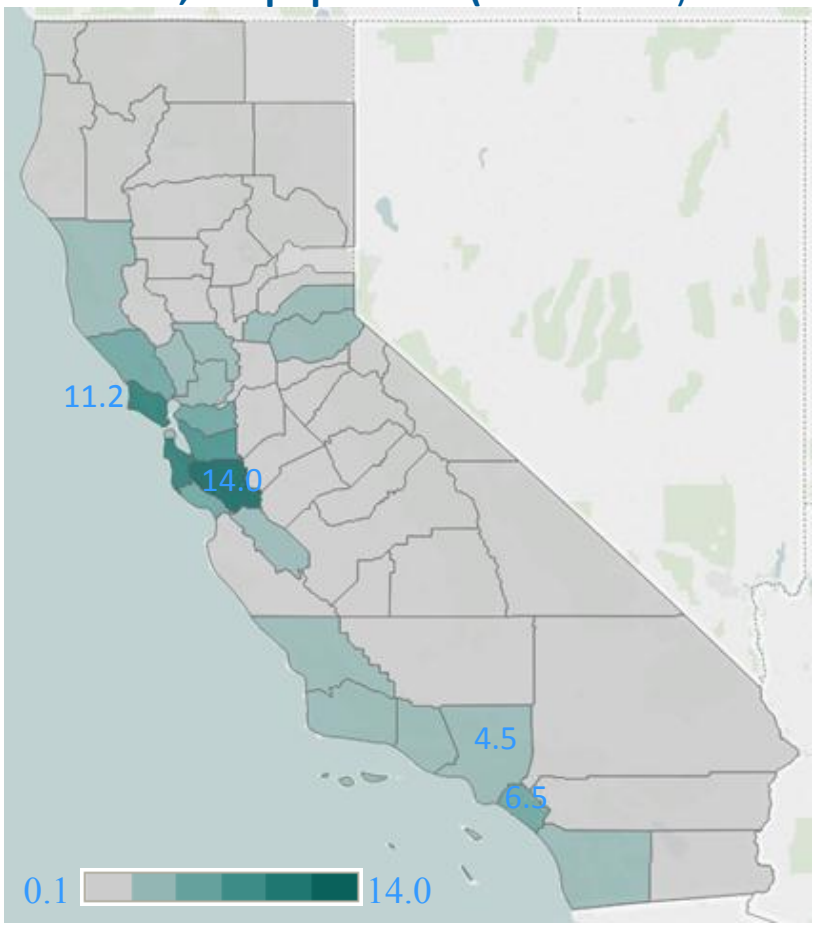


Note: Approximation assumes CA sales are 45% of national sales.
Reference: www.hybridcars.com

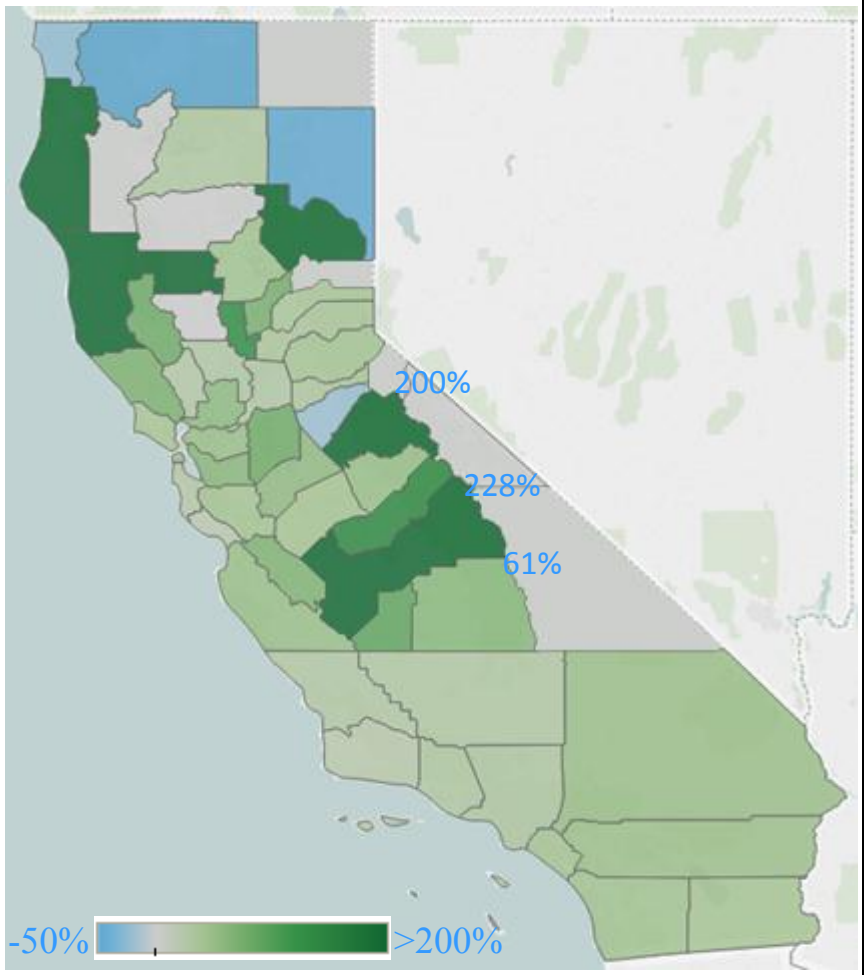
6/4/2015

Where are ZEVs Located?

New ZEV registrations (2010–2014) per 1,000 population (18 or older)



Percent change in density, 2013–2014



Source: Center for Sustainable Energy,

CEC Electric Vehicle Support

Total EVSE Funding: $38.3 million

Total Funded = 7,754 chargers

- Commercial = 2,742
- Residential = 4,175
- Workplace = 718
- DC Fast = 119

Plus 19 Regional PEV Readiness Planning Grants = $4.65 M

Total CVRP Support:
= $49 million

- Over 21,000 vouchers

CEC's 3-Phase PEV Infrastructure Deployment Strategy

- **Phase 1:** Frontload PEV infrastructure and establish framework for PEV infrastructure planning (2010-2011)

- **Phase 2:** Continue to support the nascent, but growing, PEV market with more finely tuned solicitations, plans and actions (2011-2015)

- **Phase 3:** Deploy PEV infrastructure based on refined Statewide PEV Infrastructure Assessment, Regional PEV Readiness Plans and ongoing stakeholder input (2015 onward)

California's 2010-2012 PEV Infrastructure Funding in San Diego, Los Angeles, Sacramento and Bay Area

- Partnered with Federal ARRA Stimulus Grants: EV Project and "Charge America" (PON-08-010).
- Awarded over $16 million in grants for over 4,200 charge points to ECOtality, Coulomb, Clipper Creek, Association of Bay Area Governments, Southern California Collaborative and others.
- Additional awards for $7.5 million for residential, workplace, fleets and DC fast charger demonstrations (PON-11-602).

Sacramento State Garage EVSE Installation

9 L2 Chargepoint Chargers

Scripps Institute of Oceanography, UC San Diego

AES L2 Charger

CEC Charging Infrastructure Investment PON-13-606

- $13.67 million for Workplaces, Corridors, Destinations, Multi-Unit Dwellings
- 91 DC Fast Chargers
- 937 Charge Points
- Required to coordinate with PEV Readiness Plans

DC Fast Charger recently installed at Fresno State University


CALIFORNIA ELECTRIC VEHICLE
FAST CHARGING STATIONS
Medford
Redding
Chico
Reno
Carson City
Twin Falls
Salt Lak
Santa Rosa
Sacramento
San Francis
Oakland
Modesto
San Jose
Fresno
Salinas
CALIFORNIA
Bakersfield
San Luis Obispo
Las Vegas
Henderson
St. George
Palm Springs
Los Angeles
San Diego
Yuma
Mexicali
BAJA CALIFORNIA
Presco
MAP LEGEND
DC Fast Charger
NRG eVgo
CEC Planned
Tesla Super Chargers
Other Planned
0 50 100mi

Energy Commission Regional Readiness and ZEV Implementation Solicitations

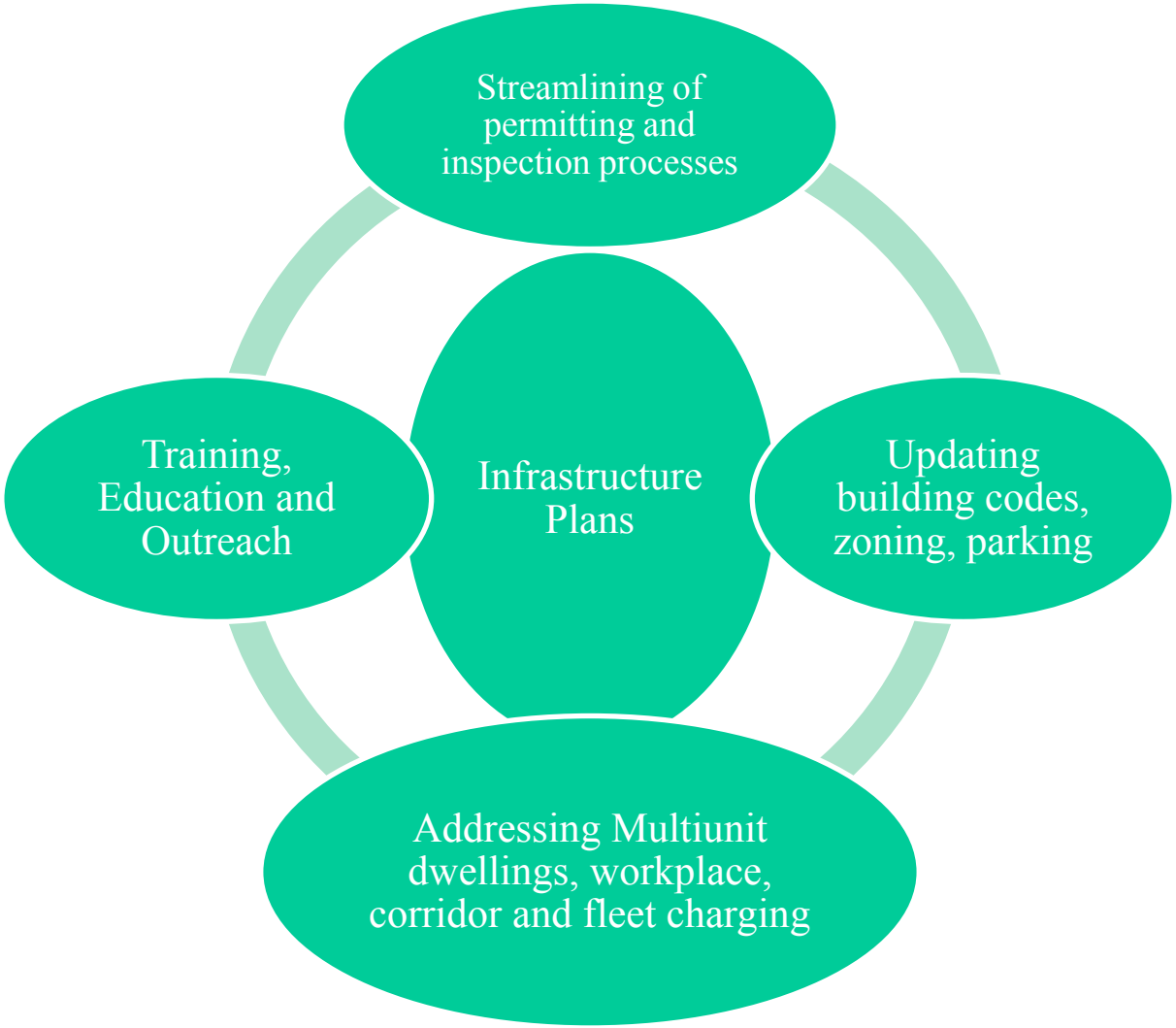
PON-10-602: Established 10 Regional PEV Readiness Plans for $2M

PON-13-603: Awarded 8 Alternative Fuels Readiness Plans for $2.27M (7 PEV-related plans for $1.67M)

PON-14-603: Awarded 8 ZEV Implementation Projects for $2.03M ($1.67 M PEV-related)

PON-14-607: Awarded 5 PEV Implementation Projects, 2 regional ZEV projects for $1.375M ($1.206M PEV-related)

Regional PEV Readiness



PEV Implementation Activities

- Permitting and Inspection Process
- EVCS Installation Process
- PEV Signage
- PEV Awareness
- Local Government Code Adoption and Training

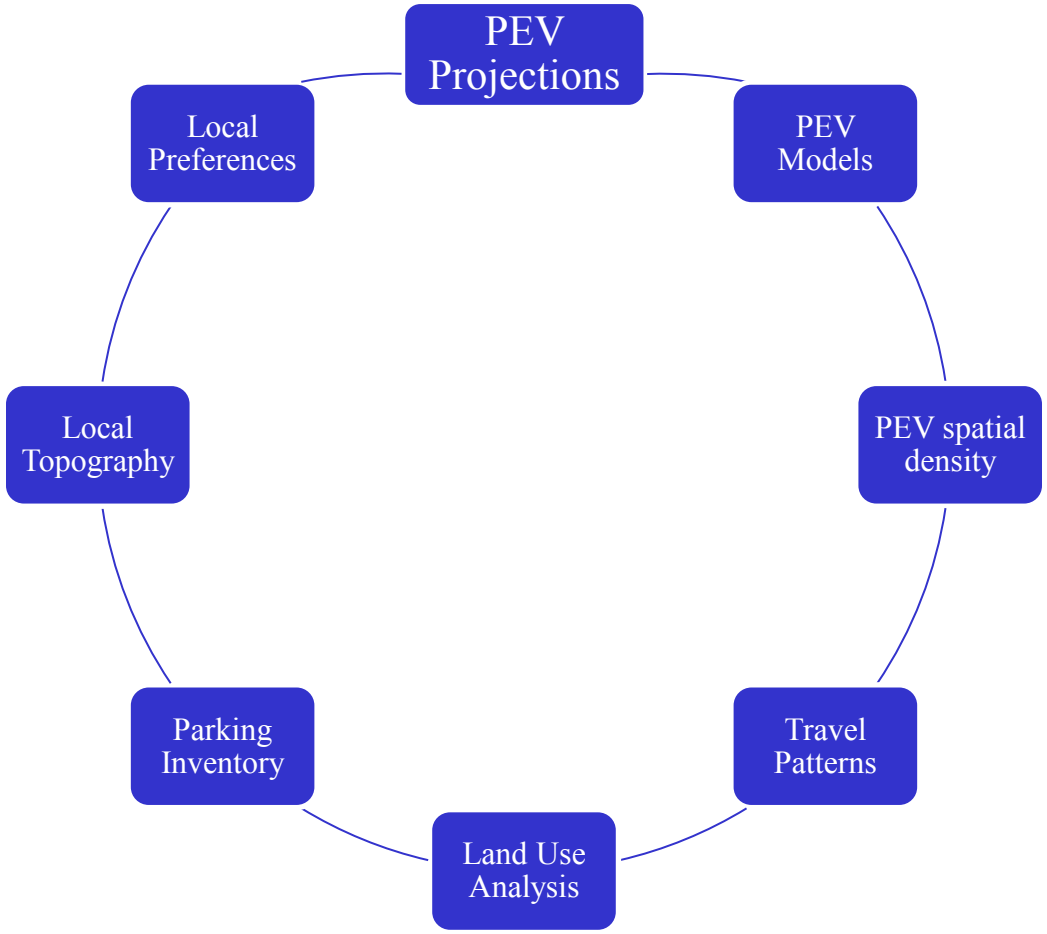
Energy Commission and DOE Regional PEV Planning Grants (Completed)

Awardee	CEC $	DOE $
Bay Area Air Quality Management District	$200,000	$300,000
Monterey Bay Area (BAAQMD)	$200,000	NA
Coachella Valley Association of Governments	$200,000	NA
Redwood Coast Energy Authority (North Coast)	~$200,000	NA
Sacramento Area Council of Governments	$200,000	$75,000
San Diego Association of Governments	~$200,000	$100,000
San Joaquin Unified Air Pollution Control District	$200,000	$75,000
City of Mt. Shasta (Upstate Region)	$200,000	NA
South Coast Association of Governments	$200,000	$300,000
Ventura County Air Pollution Control District (Central Coast)	$200,000	$50,000

Energy Commission ZEV- Related Alternative Fuel Readiness Planning and Implementation Awards (Ongoing)

Awardee	CEC $
Redwood Coast Energy Authority	$300,000
Monterey Bay Unified Air Pollution Control District	$300,000
County of Santa Barbara	$299,100
San Diego Association of Governments	$300,000
City of Davis	$200,000
San Diego Association of Governments	$200,000
City/County Association of Governments-San Mateo	$275,810
City/County of San Francisco	$300,000
City of Mt. Shasta (Glenn-Colusa Readiness Plan)	$200,000
Tahoe Regional Planning Agency	$200,000

Examples of Factors Used in Development of Regional Charging Infrastructure Plans



Examples of Approaches to Regional PEV Infrastructure Planning

- **Upstate and North Coast Regions:** Agent-based modeling to evaluate impact of infrastructure on PEV drivers' experiences using various PEV penetration rates. EVCS sites ranked using macro-siting rubric tool.
- **Coachella Valley:** Survey of early adopters to predict future residential growth and model for workplace/opportunity charging resulting in matrix of morning/evening commutes and potential trip completions
- **Sacramento Region:** Identifies PEV driver characteristics and uses Census data and 2035 travel model data to predict common destinations. Corridor analysis uses travel model data to estimate EVCS demand based on vehicle range, miles driven per tour, and route. Public opportunity EVCS optimized based on travel corridor analysis, travel behavior, land use and public space.

Note: Bay Area, SCAG and San Joaquin Plans discussed later during workshop by region representatives.

Multi-Unit Dwelling Challenges

- Cost
- Availability of power supply
- Proximity to metering equipment
- Physical limitations
- Parking issues
- HOA requirements
- Allocation of charging costs
- Complexity of decision-making

Workplace Charging Challenges

- Cost of installation
- Cost of equipment
- Congestion
- Charger expansion

DC Fast Chargers on Highway Corridors: Challenges

- Siting and site host availability
- Costs and business case
- Power upgrades and impact on local transformer
- Permits
- Demand charges

CEC Upcoming Investments in Charging Infrastructure and Regional Readiness

- 2015-2016 ARFVTP Investment Plan
  - $17 M for Charging Infrastructure
  - $2 M for Regional Alternative Fuel Readiness and Planning
- CA Pollution Control Financing Authority - CalCAP EV Charging Station Financing Program ($2 M) (June 18th Webinar hosted by PEV Collaborative http://www.pevcollaborative.org/CalCAP)
- EV Infrastructure Solicitation(s) in 2015-2016 for $27 M.


California
Electric Vehicle Fast Charging Stations
Oregon
Idaho
Nevada
Arizo
Mexico
Legend
DC Fast Charger
Tesla Supercharger
California Energy Commission Planned
Investor Owned Utilities
Bear Valley Electric Service
Liberty Utilities
PacifiCorp
Pacific Gas & Electric Company
San Diego Gas & Electric
Southern California Edison
PacifiCorp
PG&E
Liberty Utilities
SCE
Bear Valley Electric Service
SDG&E
Crescent City
Redding
Sacramento
South Lake Tahoe
San Francisco
Tracy
Modesto
Fresno
Monterey
Lost Hills
Bakersfield
Barstow
Santa Barbara
Los Angeles
Thousand Palms
San Diego
California Energy Commission
1 in = 72 miles
0 37.5 75
Miles
September 2014

Resources

- Governor's 2013 ZEV Action Plan
  http://opr.ca.gov/docs/Governor%27s_Office_ZEV_Action_Plan_%2802-13%29.pdf

- Investment Plan for the Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP)
  http://www.energy.ca.gov/2014-ALT-01/

- 2014 Integrated Energy Policy Report Update
  http://www.energy.ca.gov/2014_energypolicy/

- California Air Resources Board
  http://www.driveclean.ca.gov/

Resources (continued)

- California Statewide Plug-in Electric Vehicle Infrastructure Assessment
  http://www.energy.ca.gov/2013-ALT-01/documents/index.html

- Most Recent Electric Vehicle Charging Infrastructure Solicitation
  http://www.energy.ca.gov/contracts/transportation.html#PON-13-606

- PEV Collaborative Statewide and Regional PEV Readiness Reports
  http://www.pevcollaborative.org/pev-readiness-reports

- CalCAP EVCS Financing Program
  http://www.treasurer.ca.gov/cpcfa/calcap/evcs/

Questions?

For more information contact

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